NEWSLETTER
Of The
Arboretum of The Barnes Foundation

NUMBER 6 · MARCH 1971

THE AFRICAN TOUR

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Between January 2 and 28 my wife and I conducted a group of 20 persons (many of them members of the Arboretum school) on a botanical and horticultural tour of tropical and southern Africa.

The start of our trip was anything but auspicious. We left Philadelphia on the evening of January 2, planning to change planes in London for Paris the following morning. Unfortunately London was closed down and we were forced to land at the Frankfurt airport which, since several other flights had suffered a similar fate, was a scene of the utmost confusion. It finally became necessary to split our party–one group flying from Frankfurt to Paris, the second contingent leaving six hours later ostensibly for Paris but being forced to land in Tours and proceed from there to Paris by train, arriving at our hotel after 2 A.M.

Following a very few hours sleep we departed early the next morning for Dakar, the capital of Sénégal. Our flight took us across the Sierra Nevada of southern Spain and over the snow-capped Atlas mountains of Morocco. It is on the slopes of the latter that the Atlas cedar (*Cedrus atlantica*) forms dense stands. After flying across the western Sahara we landed in Dakar in late afternoon.

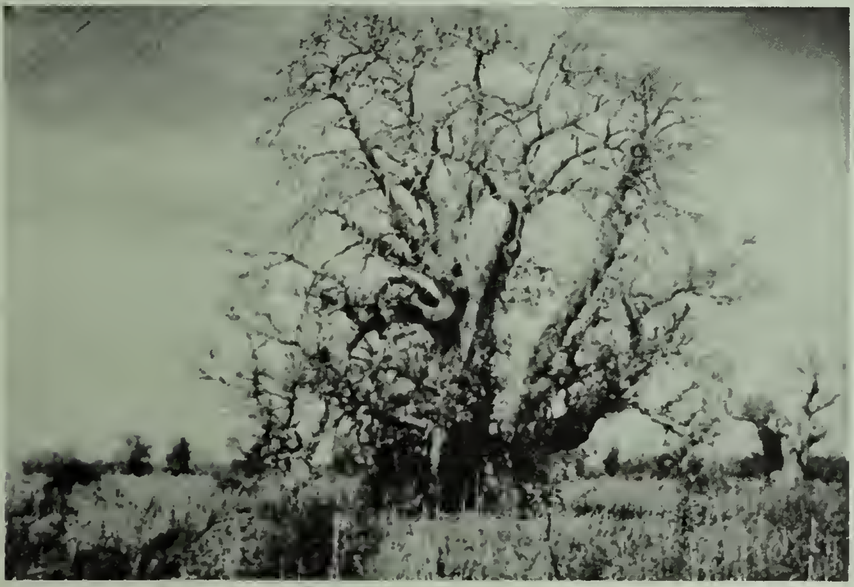

Fig. 1. *Adansonia digitata*, the baobab.

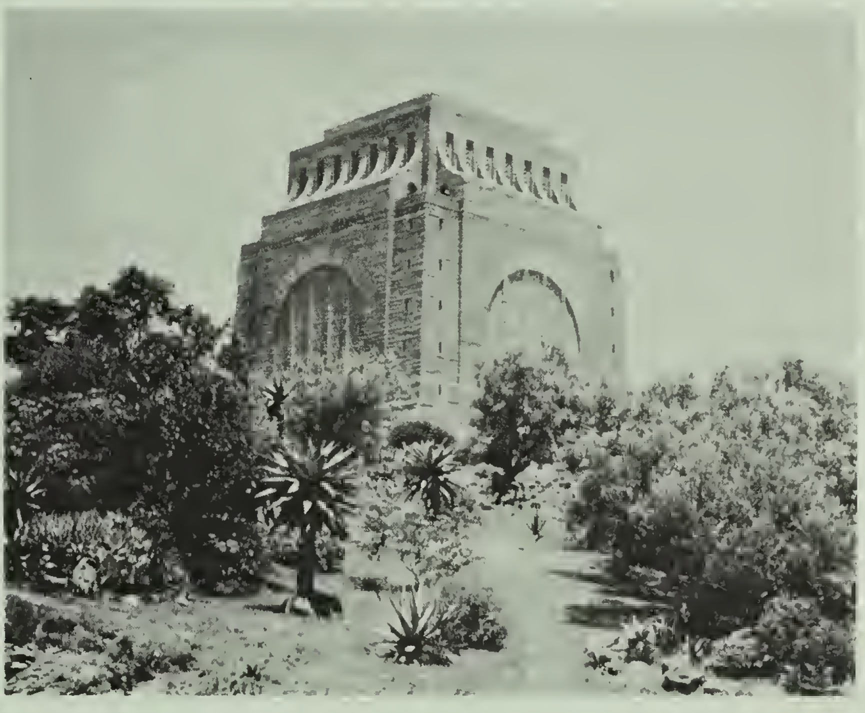

Fig. 2. Monument to the Battle of Blood River

Dakar is approximately 15° north of the Equator and the tropical nature of its vegetation was at once apparent as we drove into town from the airport. Most of the plants we saw were introduced from other countries, e.g. *Bougainvillea, Opuntia, Agave, Casuarina* and *Terminalia.* A few, however, were indigenous to this region; these included the giant milkweed (*Calotropis*) and the milk-spurge (*Euphorbia Tirucalli*). Although the latter was first described from the Malabar coast of India, it is believed to be a native of Africa.

It was to Sénégal in 1749 that the young and then unknown French botanist, Michel Adanson, came and established his reputation. Adanson remained in Sénégal for more than four years during which time he made extensive observations on the plants and animals. One of the results of his efforts was his "Histoire Naturelle du Sénégal," published in 1757.

A plant which had greatly intrigued Adanson was the "calabash" tree or baobab, a tree with a large swollen trunk and grotesque branches. He assigned this to the Malvaceae

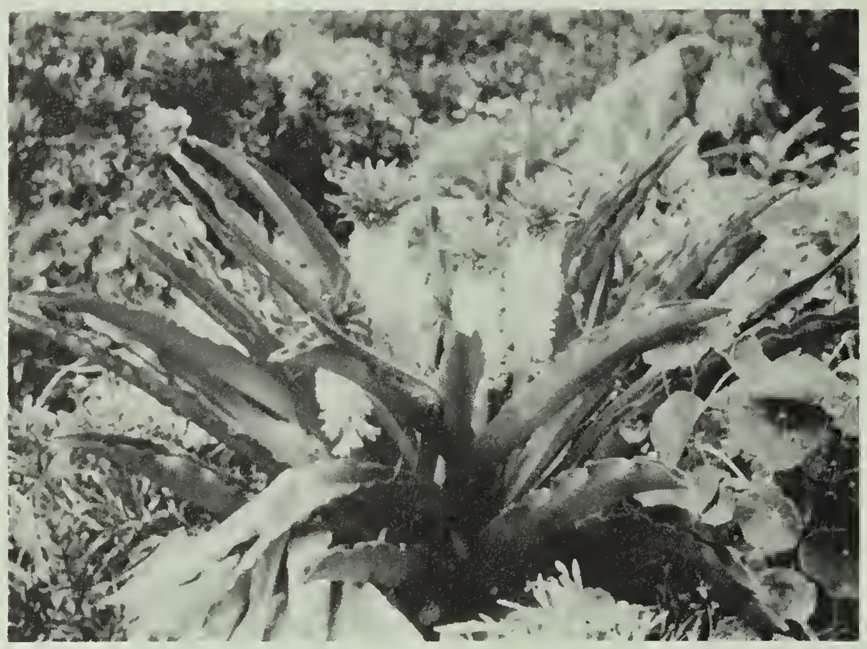

Fig. 3. *Eucomis undulatus.*

or Mallow Family, although today it is placed in the closely related Bombacaceae or Silk-cotton Family. Linnaeus later named this genus *Adansonia* in his honor. This tree has appeared on several postage stamps issued by Sénégal. (Fig. 1).

The morning following our arrival was devoted to sightseeing. We visited first an extensive and very colorful native market in which the brilliant hues of flowers and fruit were exceeded only by the costumes of the women. One of the plants seen frequently in floral arrangements was the lion's-ear. This is *Leonitis Leonurus*, a member of the Mint Family with flaming orange-red corollas. We were to see this subsequently (although usually past the flowering stage) in every country on our tour.

A drive around the rocky headland of Dakar provided some spectacular scenery, including a distant view of the island of Gorée, which Adanson had visited on at least two occasions. Luncheon that day was at a picturesque restaurant near the sea at Cap des Biches. On the way we passed through a veritable forest of baobabs, at this season totally devoid of foliage.

The upper beach near the restaurant was fringed with a dense growth of some succulent plant which we supposed would be one of the special attractions of the West African flora. Closer inspection, however, revealed that it was one of the prickly pears or species of *Opuntia* from our southwestern states (probably *O. Engelmanii*), here completely naturalized.

Following luncheon we drove to the Parc Forestier et Zoologique, where preparation for our arrival had been made by the director, M. el Jadji Sène. The primary function of this park is the testing of trees and food plants for local use. The result was that we saw here many exotic species which were being grown with a view to assessing their commercial or utilitarian value. These included such Australian genera as *Eucalyptus* and *Grevillea*, several species of cotton (*Gossypium*) various members of the Myrtaceae, such as *Melaleuca* and *Callistemon*, and the New World tropical akee (*Blighia*). One of the surprises was *Pluchea ovalis*, here a robust shrub, rather than the herbaceous perennial which we associate with that genus in the salt marshes of eastern North America. Conspicuous on all sides was the East Indian Kassod-tree, *Cassia siamea*, with its bright golden-yellow flowers.

Early on the morning of Wednesday, January 6, we left Dakar for the day-long flight to Johannesburg, a trajectory which featured "put-downs" at four West African capitals: Monrovia (Liberia), Accra (Ghana), Lagos (Nigeria) and Kinshasa (Congo). Arrival at Johannesburg was at midnight, making this a rather full day, by almost any standard.

On the following morning Mr. Norman Arnesen called for us at our hotel. Norman (formerly a licensed professional hunter in Tanzania) proved to be our driver, courier, mentor and friend—a man with a remarkable fund of botanical and zoological information. He took us by motorcoach first to a recently constructed aviation monument (honoring those fliers who lost their lives in the war) and then to an imposing structure which commemorated the famous Battle of Blood River, which took place on December 16, 1838. (Fig. 2). This was the decisive conflict in which a handful of whites defeated a greatly superior force of Zulus. It was near here that we made the acquaintance of *Bauhinia Galpinii* a straggling shrub with salmon-colored flowers that was to stay with us throughout our travels in South Africa.

We then drove on to Pretoria, the administrative capital of South Africa, which is known as the "Jacaranda City." It is said that over 75,000 of these handsome, blue-flowered South American trees line its broad streets and adorn its parks. Unfortunately, most of them had passed their blooming peak at the time of our visit, although we saw a few still in full flower.

After lunch we visited the botanical garden of the University of Pretoria where, in the absence of the director, Dr. van der Schijff, we were received by Dr. A. Eicker and other members of the staff.

The grounds around the Department of General Botany support an amazing number of unusual plants. One of the first things to greet us was the pelican-flower (*Aristolochia grandiflora*) a tropical American vine in the Birthwort Family with large purplish-brown flowers. One of the most conspicuous families in South Africa is the Proteaceae and

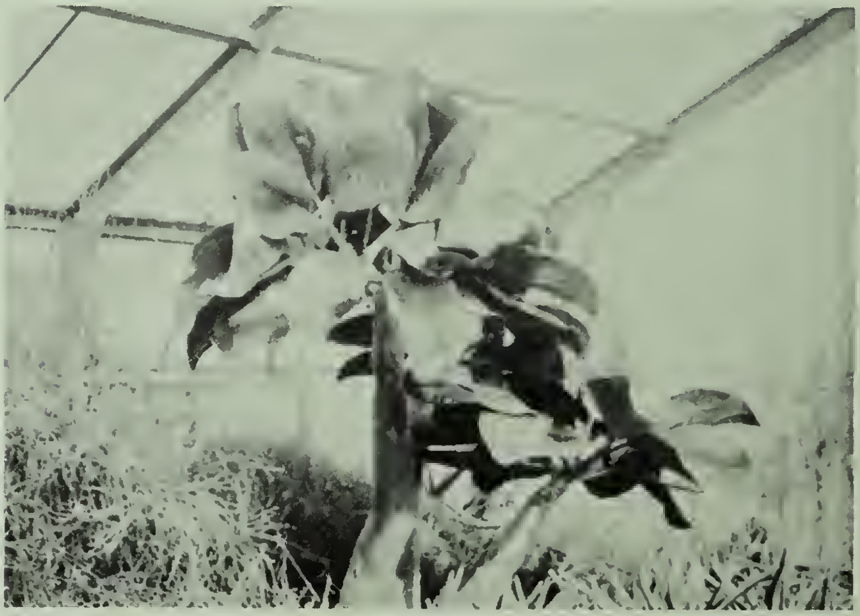

Fig. 4. *Cyphostemma Juttae.*

Fig. 5. A view in Kirstenbosch Gardens

we here received our introduction to three of its most important genera: *Leucadendron, Leucospermum* and *Protea.* We were pleased to see the honey-flower, *Melianthus*, which is widely grown in southern California as an ornamental shrub. In an aquatic section was *Eucomis undulatus,* a native member of the Liliaceae with tufts of leaves crowning the inflorescence (Fig. 3). Here too, was a tall aquatic species of *Equisetum* which produced a delicate lacy effect.

The Department boasts an excellent museum which contains, among other things, samples of wood of indigenous trees. Of great interest was a map of South Africa on which colored lights came on to designate the various vegetational provinces of the country.

From the University we proceeded to the Botanical Research Institute, of which Mr. M. J. Wells is the Director. Mr. Wells took us first to his house where we met his family and were served a delightful tea. He had laid out for our inspection a magnificent array of books and articles dealing with the flora of South Africa and presented us with a comprehensive bibliography on the subject which he had prepared for us.

We were interested to observe that the street trees in front of the house were the California plane-tree, *Platanus racemosa,* while on the lawn was a fine specimen of *Tipuana Tipu,* a South American Leguminous tree with samara-like fruit closely resembling those of a maple.

The gardens of the Institute cover an area of more than 220 acres of undulating terrain with mature stands of native trees. Here we saw a fine collection of Proteads with many species of *Protea* and *Leucospermum*. The beautiful silver-leaf tree, *Leucadendron argenteum* was well represented and there were numerous kinds of Cape-heath or *Erica.* There are over 500 species of *Erica* and most of them are native to South Africa. Unlike the low heaths of the European moorlands, these plants are usually shrubs or small trees and the corollas, which are either urceolate or long-tubular, range through a wide variety of colors from white through yellow and orange to pink, rose and fiery red.

Of particular interest to us were the splendid glass houses where we were able to obtain a preview of many of the xerophytic plants which we were to see later on our Tour. South Africa is famous for its succulent plants which belong to such families as the Liliaceae (especially *Aloe*), Aizoaceae, Crassulaceae, Euphorbiaceae, Apocynaceae, Asclepiadaceae and Compositae. Even such families as the Vitaceae and the Geraniaceae have succulent representatives in this part of the world. Indeed, one of the strangest plants in this collection was *Cyphostemma Juttae*, a member of the Vitaceae or Grape Family with upright stems and large fleshy leaves. (Fig. 4).

On Friday, January 8, we set off on the all-day drive to Kruger National Park. Our route took us first across the high veldt, at an altitude of about 5000 ft. The vegetation was reminiscent of our long-grass prairie except for the occurence of thorn-bushes (*Acacia* spp.) and an occasional aloe. Much of the country supports agriculture and we saw many fields of Indian corn (maize) as well as plantations of bananas and peanuts. We passed several stands of our native American sunflower (*Helianthus annuus*), here grown as a source of vegetable oil.

Toward noon we crossed over the Drakensburg Mts. and dropped down into the low veldt, which is akin to our short-grass prairie. The climate here is milder and we saw several plantations of mangos, litchis and citrus fruits. Our destination that afternoon was the architecturally fascinating Winkler Hotel, a few miles south of the entrance to the Park.

The next morning we had tea at 4:30 and were outside the Park gates when they swung open at half-past five. Any single day of game-viewing in one of these reserves can be good, bad or indifferent. With fifteen mammals, crocodiles and numerous birds we considered ours somewhat above average. We saw zebra, giraffe, elephant, hippo, white rhino, several kinds of antelope and monkeys and toward the very end of the day a lioness stalking a herd of wildebeest. Our friend Norman was simply phenomenal in his ability to spot and identify the animals long before we were even aware of their presence.

The vegetation in Kruger is largely of the bushveldt type, but we observed several interesting trees including the mareola, *Sclerocarya caffra* (Anacardiaceae), African ebony

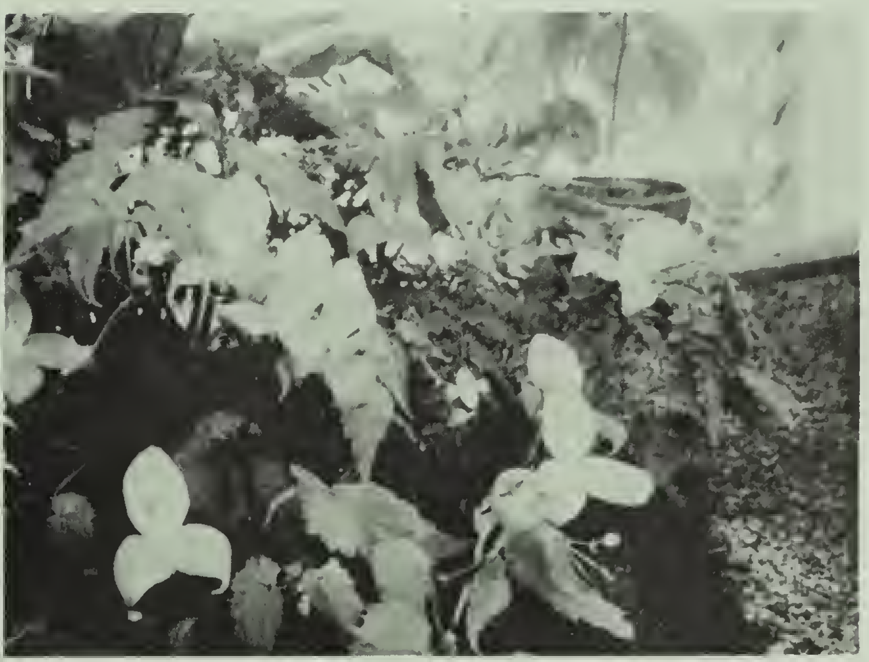

Fig. 6. *Disa uniflora.*

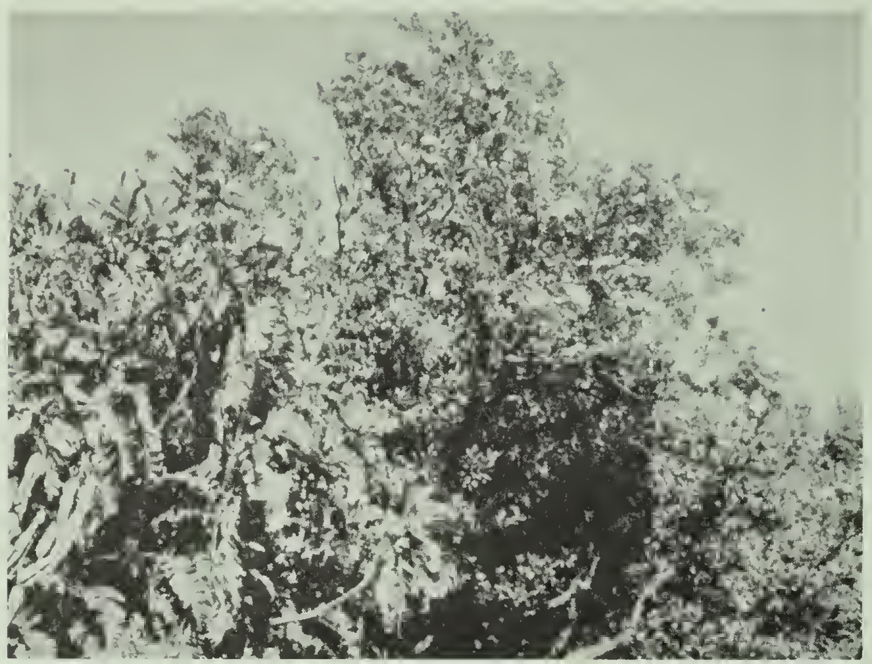

Fig. 7. *Magnolia grandiflora* in the Cape Town Garden.

Diospyros mespiliformis (Ebenaceae) and dog-plum, *Ekebergia capensis* and Cape-mahogany, *Trichilia emetica* (both of the Mahogany Family or Meliaceae).

That night we returned to the Winkler Hotel and the following day drove back to Johannesburg where in late afternoon, we took the plane for Cape Town.

Our courier and guide during our stay in Cape Town was N. J. (Tiger) Wright. Not only did he possess an intimate knowledge of all sections of the Cape Province but, in addition, was an enthusiastic amateur botanist and photographer. He presented us with a color chart depicting 48 species of Cape heaths and loaned us a collection of several hundred of his transparencies of native plants along with a viewer.

One thing we learned, from Tiger's slides was that we should have come to South Africa two or three months earlier in order to see most of the plants at the height of their bloom. We were told later that September and October are the ideal times to be there.

Despite this fact, however, we saw a great many plants in flower and consider our visit to have been eminently rewarding.

In and around Cape Town we were struck, as we had been at Johannesburg, by the prevalence of pines. Since the genus *Pinus* is not native to the southern hemisphere, these have been introduced and have escaped from cultivation. Many were the umbrella-pine or stone-pine (*P. Pinea*) from the Mediterranean, but there were also numerous lofty specimens of the Monterey pine (*P. radiata*) from southern California. The same is true of *Eucalyptus*, which is ubiquitous in the vicinity of both cities, and even along the highways, but it was only near Cape Town that we saw the brilliant red-flowered, ones such as *E. ficifolia.* The genus, of course, is native to Australasia, where it contains some 500 species.

The morning of Monday, January 11, was a time of leisure and on the afternoon of that day we embarked upon a round of sight-seeing which took us along the Atlantic shore under the shadow of Table Mountain and the Twelve Apostles, a series of jagged peaks extending southward from Table Mountain. Our tour culminated in a cable-car ascent to the top of Table Mountain, whence we had a magnificent view of the city and its environs. The crevices on the rocky summit were occupied by *Athanasia crithmoides*, a densely matted, yellow flowered Composite with rigid, finely divided leaves. All around us on the slopes and at the base of the mountain were Proteads, of which the genus *Leucospermum* was the most conspicuous.

On the following day we visited Kirstenbosch, the famous National Botanical Garden of South Africa. Dr. H. B. Rycroft, the distinguished director of this garden, had made arrangements for our arrival and his assistant, Mrs. E. P. du Plessis, was on hand to show us around.

It would be difficult to conceive of a more spectacular setting than that occupied by this lovely garden of 1300 acres, which nestles in a vast amphitheater at the base of the Apostles. (Fig. 5). We followed a series of winding walks through plantings of Ericas and Proteads. In addition to the genera in the latter family which we had already seen, there were here *Mimetes* and *Serruria.* We saw our first specimens of the King Protea (*P. cynaroides*), somewhat past bloom but the "blushing bride" (*Serruria florida*) was still in good condition. The Compositae were represented by such genera as *Gerbera, Helichrysum, Arctotis, Gazania* and *Senecio*, while *Agapanthus* and *Watsonia,* two native Monocots, were much in evidence. *Gladiolus* was in its element, with a wide variety of colors.

One of the surprises of the garden was a huge tree of *Ilex mitis*. This species is one of the few hollies native to South Africa.

A special feature of this garden is a superb collection of Cycads in which all nine genera and scores of species of this ancient family of Gymnosperms are represented.

We were pleased to see *Alberta magna*, a tree belonging to the Rubiaceae, with bright red flowers, and several species of *Erythrina* with their brilliant scarlet blossoms.

As might be expected, most of South Africa's multitudinous succulents are cultivated in this garden. Many of them are grown on the crests of walls, which renders it easy to view them at eye-level. The Aizoaceae bulk large in this collection with such genera as *Delosperma, Drosanthemum,*

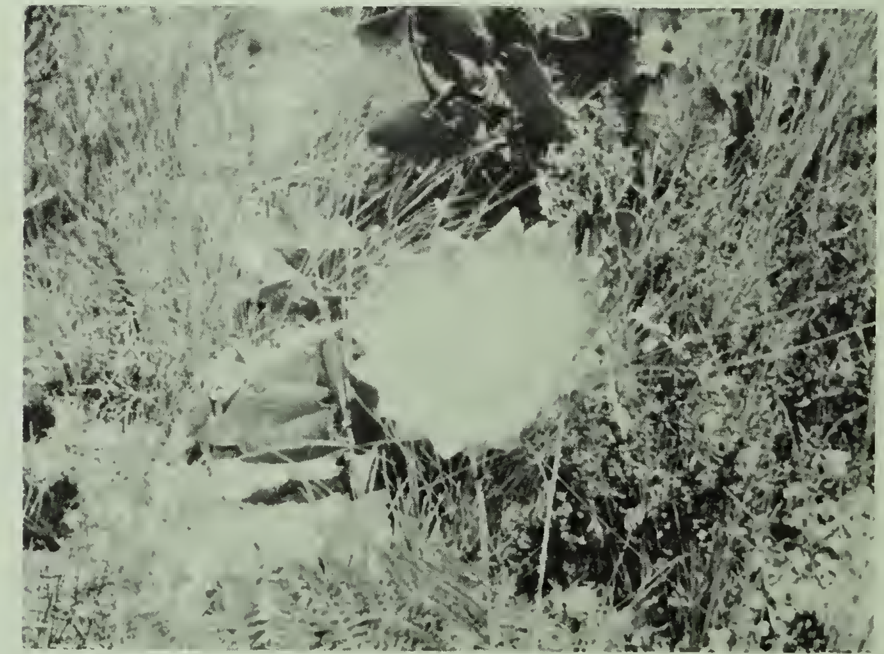

Fig. 8. *Protea cynaroides,* the King Protea

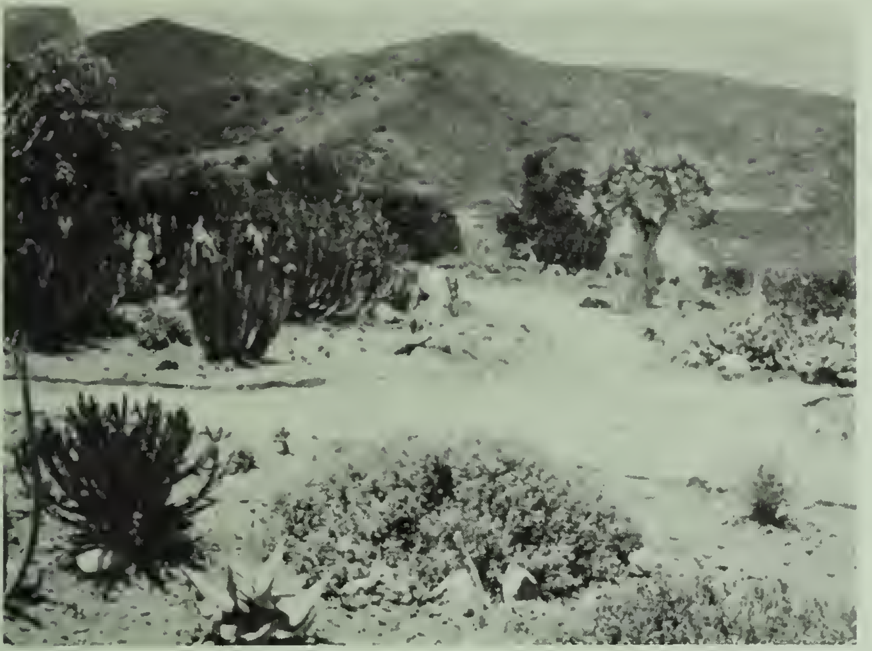

Fig. 9. General view of the Karoo Gardens

Khadia, Lampranthus and *Ruschia.* The last named should not be confused with *Rochea*, a brilliant red-flowered member of the Crassulaceae (*R. coccinea*). Here again was *Cyphostemma Juttae,* which we had seen at the Research Institute in Pretoria.

Of the well-stocked greenhouses there is space only to mention *Disa uniflora,* the much publicized terrestrial red orchid of the Cape Province (Fig. 6).

Later in the day some of us made our way to the public gardens in the city of Cape Town. Conspicuous here were many fine old trees of "English" oak (*Quercus robur*) said to have been planted two or three centuries ago. It was interesting to see our own southern bull-bay (*Magnolia grandiflora*), here in full flower, growing next to tall clumps of *Strelitzia*, the bird of paradise flower. (Fig. 7). There were enormous plants of a candelabra-like spurge (*Euphorbia ingens*) from Natal and fine mature specimens of *Aloe Bainesii*. We were intrigued to note a tree totally devoid of foliage, but laden with bright red, cup-shaped flowers. This proved to be *Brachychiton acerifolium,* a member of the Sterculiaceae known as the Australian flame-tree.

The garden also includes a conservatory with an excellent collection of tropical plants.

On January 13 we drove out to the Harold Porter Botanic Reserve at Betty's Bay, one of the several branch gardens of Kirstenbosch. Here we were met by Mr. W. Eberson, the Curator, who explained that the garden had been seriously damaged by fire a few months earlier. The effects of the burn were evident all around us, but many of the Proteads, for which this garden is renowned, were making a valiant recovery. In fact, it was here that we obtained our best pictures of the flower of the King Protea. (Fig. 8).

Two genera which were of frequent occurrence in the open grassy portion of the garden were *Helichrysum* (one of the strawflower Composites) and a *Selago*, a member of the *Selaginaceae,* a small family endemic to Africa. Another conspicuous plant was *Pelargonium cucullatum,* a very viscid-leaved geranium with mauve flowers. *Virgilia orobode*, a small African Leguminous tree, was making a fine show with its racemes of rosy-purple flowers.

This garden is traversed by a small river and as we followed it upstream we entered a narrow defile on the grassy slopes of which were growing the *Disa* orchid which we had seen at Kirstenbosch the preceding day. Two trees, which intrigued us here were *Curtisia dentata* (a member of the Cornaceae) and *Platylophus trifoliata,* a monotypic genus in the Cunoniaceae.

Following luncheon at Hermanus, a resort facing the Indian Ocean, we paid a brief visit to Fernkloof, another satellite installation of Kirstenbosch. Here, among other things, we saw plants of *Aeonium arboreum,* a handsome succulent native to Morocco, and luxuriant specimens of *Portulacaria afra,* a rampant shrubby member of the Portulacaceae which is said to be a favorite food of elephants.

Thursday, January 14, found us on our way eastward over the Dutoitkloof Mountains to the Karoo Gardens at Worcester, also a branch of the Kirstenbosch Garden. (Fig. 9). Here we were welcomed by the Curator, Mr. Frank Stayner, who spent the entire morning showing us around.

The term Karoo derives from a Hottentot word denoting a dry barren place and the Great and Little Karoo of South Africa are just that—arid, stony essentially treeless tablelands supporting a meager though fascinating vegetation found nowhere else on earth.

It is in these formidable habitats that certain succulent families really come into their own. Conspicuous among these is the Aizoaceae which includes the famous "stone plants," belonging to such genera as *Lithops, Fenestraria, Conophytum, Pleiospilus and Argyroderma.* These plants grow among stones and pebbles and so closely resemble them in size and color as to escape all but the closest scrutiny. Indeed, it is only when these plants flower that they can be easily detected.

Other members of this family are the "ice plants," formerly placed in *Mesembryanthemum,* but now assigned to such genera as *Glottiphyllum* and *Cephalophyllum.*

In addition to the Aizoaceae the following are some of the families of frequent occurrence on the Karoo: Liliaceae (*Aloe, Gasteria, Haworthia*); Crassulaceae (*Crassula, Cotyledon*); Asclepiadaceae (*Stapelia Huernia, Caralluma, Hoodia*).

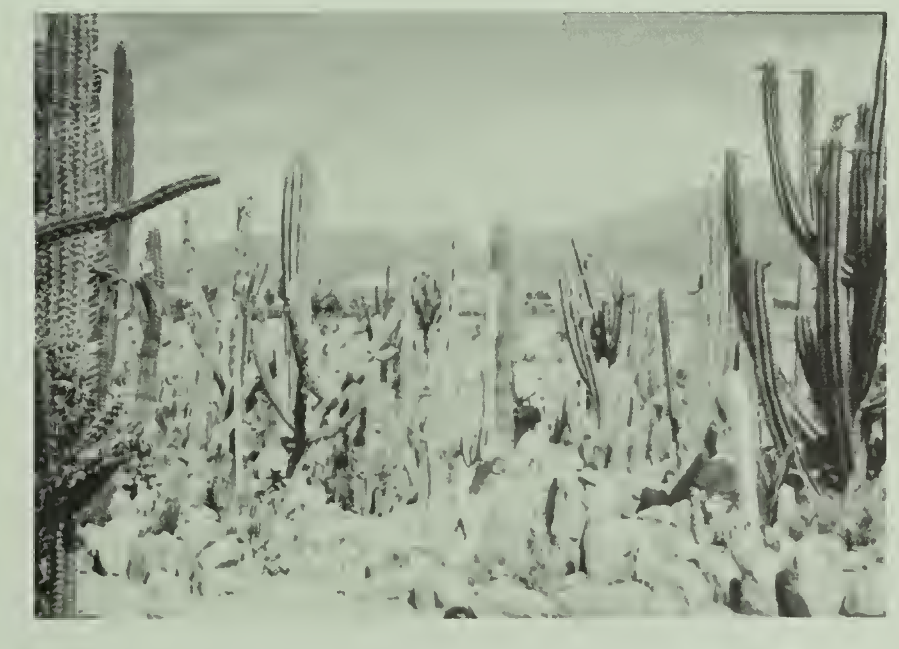

Fig. 10. Sheilam Cactus Garden.

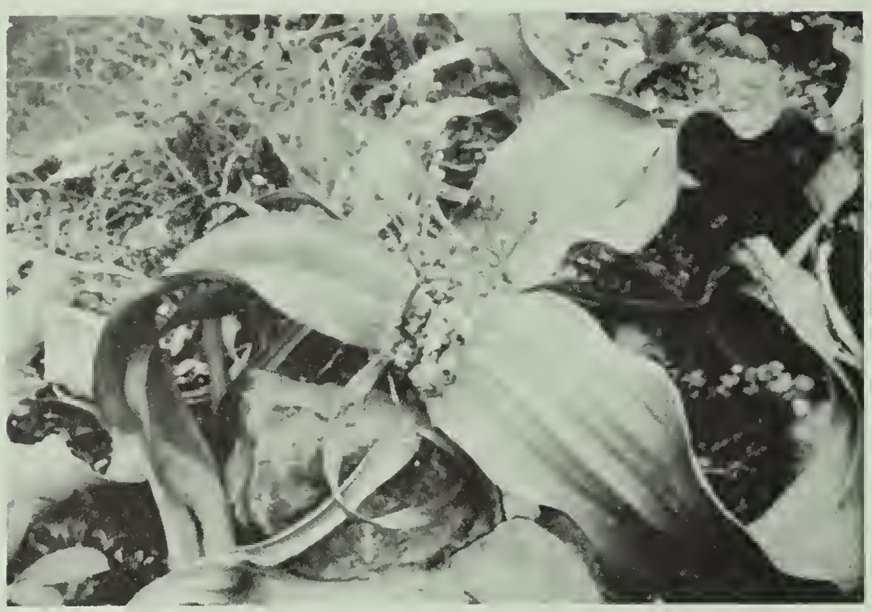

Fig. 11. *Welwitschia Bainesii* at Stellenbosch.

Although we did not actually walk across the Karoo, we saw all of the above plants (and many more) grown at Worcester under such natural conditions as to convey a convincing impression of this unique vegetation.

Among other interesting genera which we saw here were: *Sarcocaulon* (a fleshy member of the Geraniaceae) and *Psilocaulon* (an Aizoaceous plant which yields caustic potash). The "elephant plant" (*Portulacaria*) was here grown as a tall hedge and to our delight was in full bloom with terminal clusters of rose-colored flowers.

In the afternoon we drove some thirty miles to visit the Sheilam Cactus Garden and Nursery. (Fig. 10). Here was a superb assortment of those New World succulents, so similar in many respects to the xerophytic plants of Africa, but belonging to an entirely different family.

The collection contains many species of *Opuntia* and large, beautifully grown specimens of such genera as *Cleistocactus, Echinocactus, Ferocactus, Cephalocereus* and *Astrophytum.* In fact the owner told us that the only thing he lacked was a giant saguaro (*Carnegia gigantea*) and begged us to send him one!

The following day we visited first a commercial Protead nursery where such genera as *Protea, Leucospermum, Serruria,* etc. are grown by the thousand and sent as cut-flowers to market. The nursery belongs to a Mr. Bachelor who has developed the grounds around his home into something of an arboretum. Here again was *Alberta magna*, in full flower, the same *Tipuana* we had seen in Pretoria (but now in bloom rather than fruit) and the Chinese umbrella-tree (*Firmiana simplex*), an Oriental member of the Sterculia Family.

We then drove through the picturesque city of Stellenbosch to inspect the Botancial Garden of the University. This is a small garden (only about four acres) but it contains an amazing number of interesting trees and shrubs. Among the latter we were particularly attracted by a robust plant of *Cassia didymobotrys* with upright racemes of bright yellow flowers, a species which bears a remarkable resemblance to *C. alata* of Mexico.

Stellenbosch is perhaps most famous for its plants of *Welwitschia,* which have been grown from seed and are now sufficiently mature to be producing seed in turn. This strange genus was apparently first discovered over a hundred years ago, by Thomas Baines in Damaraland in South-west Africa and found shortly afterwards by Dr. Welwitsch at Mossamedes.

The genus *Welwitschia* is a Gymnosperm, of unkown ancestry, which develops a woody base near the surface of the ground and produces during its lifetime only a single pair of leaves. These are narrow strap-shaped structures when young, but split longitudinally as the plant grows and eventually assume a Medusa-like effect trailing over the ground. The species is said to achieve an age of several centuries, but the plants in the greenhouse at Stellenbosch are much younger, probably not more than 30 years. (Fig. 11).

In addition to *Welwitschia* the greenhouses at Stellenbosch contain a fantastic assemblage of succulents. Many of the genera we had seen at Worcester were here (*Lithops, Conophytum,* etc.) and also excellent material of such New World cacti as *Mammillaria.*

On Saturday, January 16, we took the beautiful Cape Drive which follows the Atlantic shore south to the Cape of Good Hope and Cape Point and returns along the eastern side of the peninsula, which is bathed by the Indian Ocean. The road southward is a winding one, ascending several promontories to provide views of the undulating coast-line with its several bays and harbors.

Toward the tip of the peninsula we entered Cape Point Nature Reserve, where we saw ostrich, zebra, bontebok and a troop of baboons. At the extreme southern tip there are two massive headlands, the Cape of Good Hope and Cape Point. (Fig. 12). Rounding these we headed north along False Bay through Simonstown and Kalk Bay, where we stopped for lunch.

In the afternoon we visited Groot Costantia, a famous winery and then managed to find a spot where, with several hundred thousand others, we watched the start of the yacht race from Cape Town to Rio.

The following day we left Cape Town for Johannesburg, where we changed planes for Victoria Falls in Rhodesia.

Fig. 12. The Cape of Good Hope

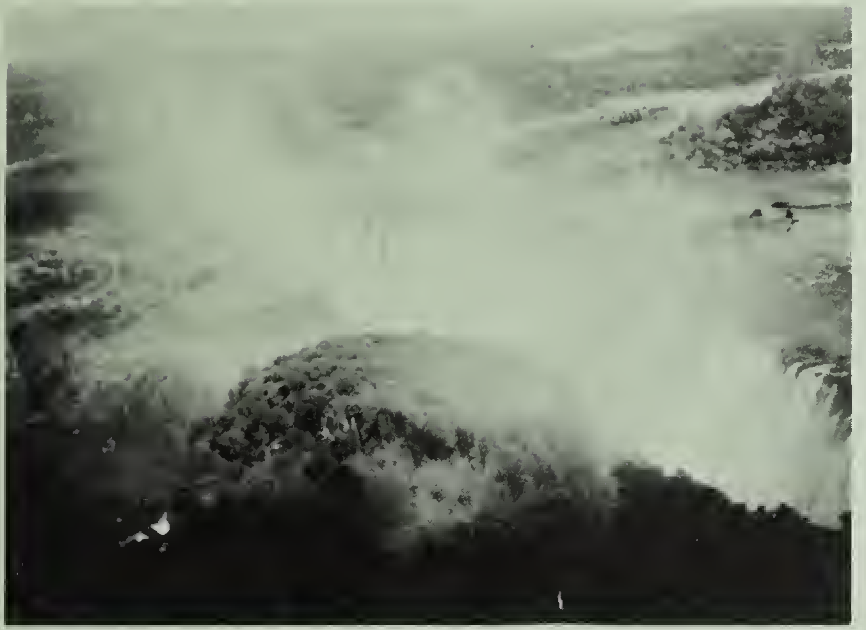

Fig. 13. Victoria Falls from the air.

Although Dr. van der Schijff had been out of town when we were in Pretoria, he and his wife very kindly came to the airport in Johannesburg to spend a few minutes with us between flights. We arrived at Victoria Falls late in the afternoon.

When David Livingstone, the great missionary-explorer, was following the Zambezi River in 1855 he heard reports from the natives of the "Smoke that thunders" and on November 16 he came upon this natural wonder and named it Victoria Falls. To say that the crest of these falls is a mile long and the drop 350 feet, are mere statistics and convey nothing of the majesty of this phenomenon—the world's largest "curtain of falling water."

We stood that first morning in front of the statue to Livingstone, gazing down into the Devils Cataract, which alone would beggar Niagara, and then walked for nearly a mile along the basaltic escarpment of the first gorge, thoroughly drenched by the spray that enveloped us.

The following morning we flew in a small plane back and forth across the falls and gained added respect for their magnitude and that of the mighty river which has created them and of the deep gorges which they have carved over the centuries. (Fig. 13).

A short distance above the Falls is the famous "Big Tree." This is a baobab (*Adansonia digitata*), the same species we had seen in and around Dakar. Although the base is certainly larger than anything we saw in Sénégal, there appears to be some question as to whether this is a single trunk or several.

In the vicinity of Victoria Falls the vegetation falls chiefly into two categories: rain forest and savanna. The former, as might be expected, parallels the course of the Zambezi River. Among its components were several genera which we recognized, such as *Terminalia, Grewia, Ficus, Zizyphus, Diospyros* and *Combretum.* In all cases, however, the species were new to us. The *Terminalia,* for example was *T. sericea,* the Grewia, *G. monticola,* the *Diospyros, D. mespiliformis,* etc. In addition there were plants with which we were totally unfamiliar; these included Rhodesian mahogany, *Copaifera coleosperma* (a tree with weeping habit, curiously bipinnate leaves and feathery white flowers; native teak, *Baikiaea plurijuga* (a handsome Leguminous tree with pink flowers and velvety brown pods); and native ebony, *Dalbergia melanoxylon* (also a member of the Leguminosae). I am indebted to Mr. James Sharp of the Rhodesian Forestry Service for the identification of these last-named.

Along the spray-drenched crests of the Falls the conspicuous plant on the forest floor was a blood-lily, *Haemanthus filiflorus,* with umbels of bright orange fruits. Also abundant was a blue-flowered, *Commelina*, looking very much like our *C. communis,* but almost certainly a different species.

On our second afternoon at Victoria Falls we rode by launch several miles up the Zambezi, passing hippopotamus which, although remaining mostly submerged, wiggled their ears in seeming recognition of our presence. We landed on a small island, where we were eagerly welcomed by a troop of very tame and very hungry black-faced monkeys and where the crew of our launch served tea.

While the tea was being brewed some of us wandered off across the island. One of the first things we saw was a member of that beautiful climbing genus in the Liliaceae, namely *Gloriosa,* in which the sepals and petals are strongly recurved. This was not *G. superba,* the species so commonly cultivated in our greenhouses, but, as far as we could determine, the somewhat duller colored but still very lovely *G. virescens.*

Another plant of frequent occurrence here was the vegetable ivory palm, *Hyphaene ventricosa*, not to be confused with *Phytelephas,* the ivory nut palm of Brazil. The Rhodesian species, which grows to a height of 60 feet produces a fruit the size of a small orange with a brown shiny shell, inside which is a layer of fibrous material greatly prized as a food by elephant and monkeys. The kernel, which is very hard and smooth, has been used in the manufacture of buttons and curios. (Fig. 14).

In the temperate New World the term savanna usually denotes a treeless, grassy plain. In the tropics, however, it can mean a grassland characterized by scattered trees and such is the sense in which it is applied here. The savanna around Victoria Falls seemed from the air to be dominated

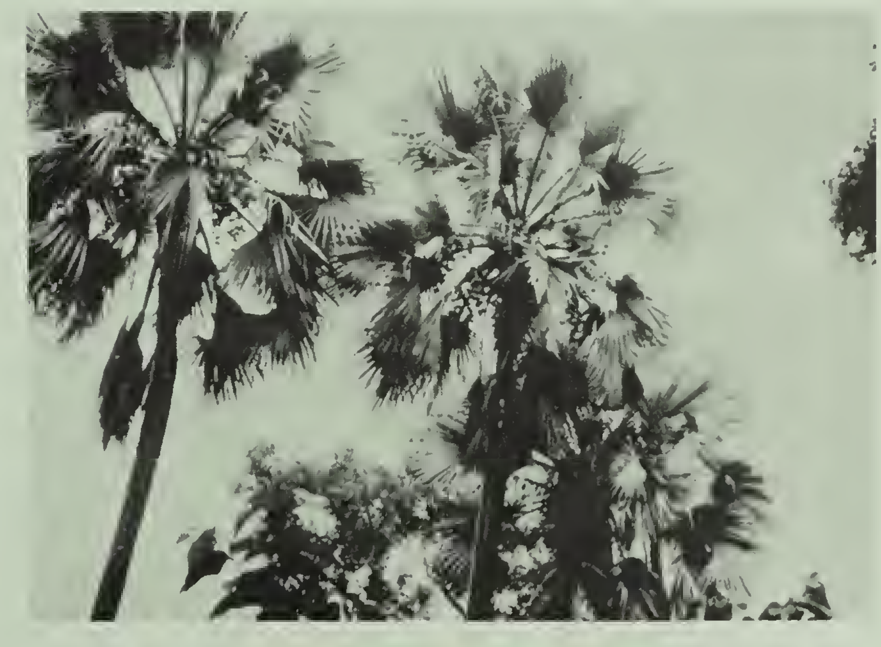

Fig. 14. *Hyphaene ventricosa.*

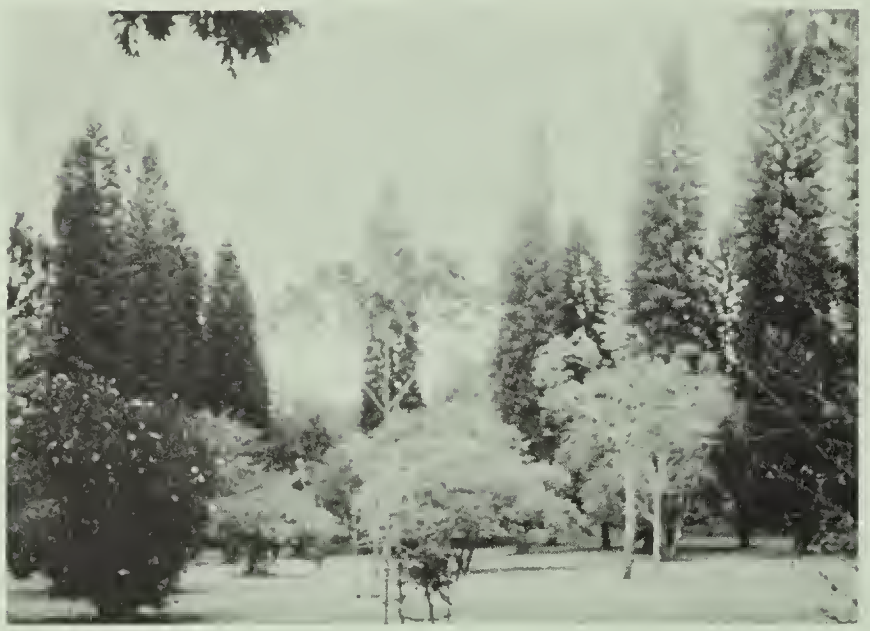

Fig. 15. Collection of *Araucaria* in the Nairobi Arboretum.

by thorn trees or acacias, but there were occasional stands of palms and several shrubs. Chief among the latter was a *Bauhinia,* not the salmon-colored form we had seen everywhere in South Africa, but here a white-flowered species which we took to be *B. Petersiana.*

We left Victoria Falls with considerable regret, a sentiment which was not alleviated by the fact that, due to some idiosyncrasy of our schedule, we were forced to fly back to Johannesburg in order to take the plane for Nairobi—a little like going from San Francisco to Los Angeles by way of Denver. Arrival in Nairobi was another midnight affair.

The capital of Kenya is a very attractive city with fine public buildings, broad streets and imaginative use of plant materials. It was interesting to observe bougainvilleas and oleanders (both in a wide variety of colors) grown as standards and planted as small street trees along many of the avenues.

On our first morning in Nairobi some of us paid a visit to the Nairobi Arboretum Forest Reserve which is under the supervision of the Forest Department of Kenya. This arboretum, which covers nearly one hundred acres contains a highly diversified collection of mature trees and shrubs. One of the things that most impressed us was its spaciousness; the trees were placed far enough apart to afford each one a chance to develop to its optimum size. This is both good for the trees and a delight to the photographer. There are relatively few arboreta of which this can be said.

It would require many hours to see everything in this arboretum and several pages merely to enumerate its treasures. The following brief account must suffice:

We walked first through an area devoted largely to Conifers, with such genera as *Cupressus, Callitris* and the New World *Taxodium.* We were pleased to observe a large tree of *Podocarpus gracilior,* a graceful species with linear leaves. Some of us had seen this on display at the Philadelphia Flower Show last spring, but here it was growing in its native Kenya. Special mention must also be made of the superlative collection of stately Araucarias, belonging to several species such as *Cookii, excelsa, columnaris* etc. (Fig. 15)

Among the broad-leaved trees there were, as might be expected, many that were native to tropical Africa. In addition to species we had seen elsewhere were *Acokanthera Schimperi* (Apocynaceae), *Croton megalocarpus* (Euphorbiaceae), *Trichilia roka* (Meliaceae) and *Vitex keniensis* (Verbenaceae).

Practically every tropical and subtropical section of the world was represented. There were *Bombax malabaricium* and *Artocarpus heterophyllus* (*integrifolius*) the Jack-fruit from India; several species of *Grevillea* and *Eucalyptus* from Australasia; *Brunfelsia Hopeana* (Solanaceae) from Central America; *Erythrina corallodendron* from the West Indies and *Aleurites moluccana* (*triloba*), the candle-nut tree from Malaya. One of the glories of the garden was a pair of trees of *Chorisia speciosa* in full bloom with their lucious, large pink flowers. This member of the Bombacaceae, or Silk-cotton Family, is a native of South America.

Mention has been made of the large trees of *Magnolia grandiflora* we had seen in Cape Town. Here, within a hundred miles of the equator, was a poor spindly specimen, about six feet tall, but bearing two perfect flowers.

That afternoon we embarked on a sight-seeing tour which culminated in a visit to the National Museum. This is advertised as the finest natural history museum in Africa and after spending an hour among its exhibits we had no desire to dispute this claim. In addition to some excellent habitat groups of mammals, it had fine collections, of fish, insects, birds, minerals and a superb series of flower paintings of native as well as exotic plants.

On Friday, January 22, we drove north to Nyeri, stopping briefly at the picturesque Chania Falls en route. After taking lunch at the Outspan Hotel in Nyeri we were driven to the entrance of Aberdale Park where we were met by an armed hunter who conducted us on foot to the famous Treetops for the night. (Fig. 16). This "hotel" is elevated well above the gound on stout timbers and is partly surrounded by trees, most of which are Cape chestnuts, *Calodendron capense,* a member of the Rutaceae with attractive purple flowers. We had seen this species earlier near Cape Town, but there it had passed flowering.

In front of the building is a large water-hole to which the animals come to drink. Since we arrived in mid-afternoon

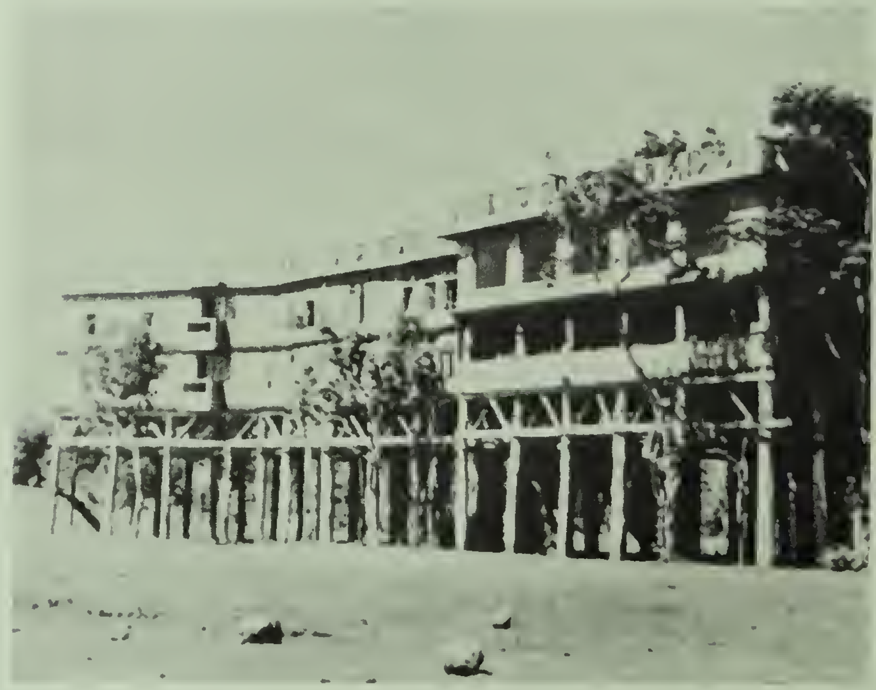

Fig. 16. Treetops Hotel.

we saw many water-buck and Cape-buffalo by daylight. Warthogs stayed on the ground below us, but baboons swarmed over our observation post on the top deck, snatching at everything in sight, including a roll of film which one member of our party was about to change.

As evening approached powerful floodlight were directed to an area bordering the water-hole which had been salted and following dinner we settled down in comfortable chairs to a prolonged vigil. We were rewarded by seeing no fewer than five white rhinoceros which came after dark and remained for a couple of hours. The wary bushbuck made a cautious approach and a single giant forest hog put in a brief appearance. Most of us turned in about midnight, only to be awakened at 4 A.M. with the news that a bongo had arrived. This is a beautiful and rather shy antelope, with a dark brown body and vertical white stripes on both sides.

The following morning we returned to Outspan for a complete day of relaxation. The grounds around this hotel are beautifully planted with a wealth of interesting material. Here were several trees in brillian red flowering condition of the Australian flame tree (*Brachychiton acerifolium*) which we had seen first at Cape Town, as well as specimens of a bright scarlet-flowered *Eucalpytus.*

A small tree with bronze foliage proved to be *Euphorbia cotinifolia,* while directly in front of the open terrace was a fine specimen of *Michelia Champaca,* a Himalayan member of the Magnoliaceae, with large lanceolate leaves and yellow flowers.

Following breakfast on Sunday, January 24 we drove back to Nairobi arriving in time for lunch. That afternoon some of us paid a return visit to the Museum and a nearby installation called "Snake Park." We thought this an unfortunate name for, although there were some snakes here (including an enormous python), there were also turtles, crocodiles and several interesting birds, the most elegant of which were several crowned cranes, a native African bird.

The next day we traveled south through mountainous country to the Amboseli Game Reserve. This area of over 1200 square miles, is located under the shadow of snow-capped Kilimanjaro (Africa's highest mountain) and is on the borderline between Kenya and Tanzania. Our accommodations here were of the safari types, which meant in this case that we were housed in very comfortable tents supplied with most of the comforts of home. Also, we were welcomed by a committee of vervet monkeys which romped back and forth over our canvas coverings and willingly accepted hand-outs with the gentlest of tiny paws.

Unlike Kruger, there are few paved roads here and our vehicles simply took off across the thorny plain seeking animals wherever the uncanny sense of our drivers thought that they might be found. On our first afternoon we saw giraffe, zebra, gerenuk and Thomson's gazelle. The following morning we observed elephant, black rhino, and numerous lions, the latter lolling about lazily and paying no attention whatever to our presence. The viewing was climaxed by seeing a cheetah (reputedly the fastest animal on four legs) make a kill of a young Thomson's gazelle for her three cubs.

That afternoon we returned to Nairobi in time for dinner and later that evening took the night plane for London whence, after a day of leisure, we departed on January 28 for home. Our African "Safari" was ended.

A New Check List

In 1966 we published a Check List of the woody plants growing in the Arboretum. This was a 28-page booklet in which the scientific names of nearly 2500 species, varieties and cultivars were arranged according to their botanical relationships. The cover depicted a twig of the fern-leaved beech (*Fagus sylvatica* 'Laciniata') which had been one of Mrs. Barnes's favorite trees.

During the four years since this Check List appeared a few species have died but a great many new ones (over 200) have been added. Because of the substantial increase in the number of species, and also since the first printing was practically exhausted, a new edition was greatly needed. Its preparation was undertaken by Mrs. Fogg, who, rather than attempting merely to revise the first edition, started from scratch and made out a 3 x 5 inch card for every woody plant growing in the Arboretum. Specimens at present in the nursery were also included, since these have demonstrated their hardiness and will be set out on the grounds as soon as they have attained the proper size.

An Index to Genera has been included in the new printing to facilitate ready location of a given genus.

The new Check List was ready in time for distribution among the students enrolled in the 1970-71 session at the Arboretum School. Anyone desiring a copy should write to the Director, Box 128, Merion, Pa. 19066.

DO I HAVE A PLANT ZOO?

William S. Patten

It has occurred to me that bringing animals from all parts of the world and caging them away from their natural habitat is similar to transferring plants from their alpine and tundra areas to our local environment. At least the zoos supply ice for the polar bears and sea-lions in the extreme hot weather. The chance of survival of plants depends on our ability to create or find conditions resembling their original home.

On our trip to Scandinavia with Dr. Fogg we saw many botanical gardens with structures planned for imported plants, especially the refrigerated greenhouse in the Botanical Garden at Copenhagen. They had plants there from Greenland, Iceland, Lapland and literally from all over the world. In Bergen, Norway, and Upsala, Sweden, they were able to winter many rare species, also in the Komarov Botanical Institute at Leningrad.

I have had difficulty with the survival of many plants. In the first place, to bring them through customs and have them fumigated allows only a small percentage to live. Secondly, to move plants with roots imbedded in rocks is risky if not impossible. This leaves propagation only by seeds or vegetative methods.

Finding the proper surroundings in the Delaware Valley is a problem. Some collectors use alpine houses or pit houses for the most tender varieties. *Silene acaulis* (cushion pink) lasts but a short while and never blooms for me. Some plants are able to adapt themselves to our hot, humid summers if placed on a north or northwest slope. *Papaver alpinum* has a hard struggle along with some Saxifrages. *Dryas octopetala* does well in the northwest around Seattle but just about makes it here; in fact I saw many plants on the trip with the American Rock Garden Society group to the northwest that are not easily adapted to this section of the country, such as *Silene Hookeri, Gaultheria Shallon, Spraguea umbellata, Castilleja miniata* and many others. *Draba miniata* has its ups and downs and needs projecting rocks and rubble for protection. The varied group of Gentians require constant care. *Cornus canadensis* is doing well but is slow in spreading as it does in Canada and spots farther north. *Arctostaphylos Uva-ursi,* or bearberry, seems to grow in numerous places from the mountains of Norway and Finland to the Middle Atlantic States. Primulas due to their many varieties are not hard to adjust to this location. Some Androsaces find a good home here along with varieties of *Oxalis.*

All in all, the trial of seed germination provides a most challenging venture and while the percentages may be small it does not seem cruel to try them. The reward of seeing tiny blooms on some precious plant from seed or a cutting from fellow rock-gardeners is tremendous.

CRABAPPLE CHECK LIST

The United States National Arboretum, Washington, D.C. announces the publication of the second of their irregular series entitled *National Arboretum Contribution No. 2.* This second number, *History, Progeny* and *Locations of Crabapples of Documented Authentic Origin* of 107 pages, was written and complied by Roland M. Jefferson, Botanist at the U.S. National Arboretum. It is the most documented treatment of cultivated crabapples–with botanical species, varieties and cultivars–that has ever been published. In addition to detailed notations of origin and source, the work also includes general morphological descriptions, current source locations and genealogical formulae of clones of hybrid origin. Copies are available to botanists and horticulturists by writing to Roland M. Jefferson at the U.S. National Arboretum, Washington, D.C. 20002.

TROCHODENDRON ARALIOIDES

One of the most interesting and unusual plants growing in the Arboretum is *Trochodendron aralioides* Sieb. & Zucc.

The genus *Trochodendron,* which contains only this one species, is a member of the family Trochodendraceae. Some authorities include the genus *Euptelea* (with three species) in this family, others place it in a family of its own, the Eupteleaceae.

T. aralioides is an Oriental plant, occurring in Japan (in the mountains of Honshu, Shikoki and Kyushu) as well as in south Korea and Taiwan.

In its native habitats this species may be a tree up to 50 or 60 feet. The evergreen somewhat coriaceous leaves are rhombic narrowly or broadly obovate with shallowly crenate margins and are usually crowded at the ends of the greenish branchlets. (Fig. 1)

The flowers are borne in a terminal upright raceme, and although perfect (bisexual), possess no perianth. The stamens are numerous and the 5 to 10 carpels which occur in a whorl are united at the base, each carpel developing into a follicle containing several seeds.

It is the appearance of the numerous spreading stamens and carpels that has led to the scientific name *Trochodendron* (literally "wheel-tree").

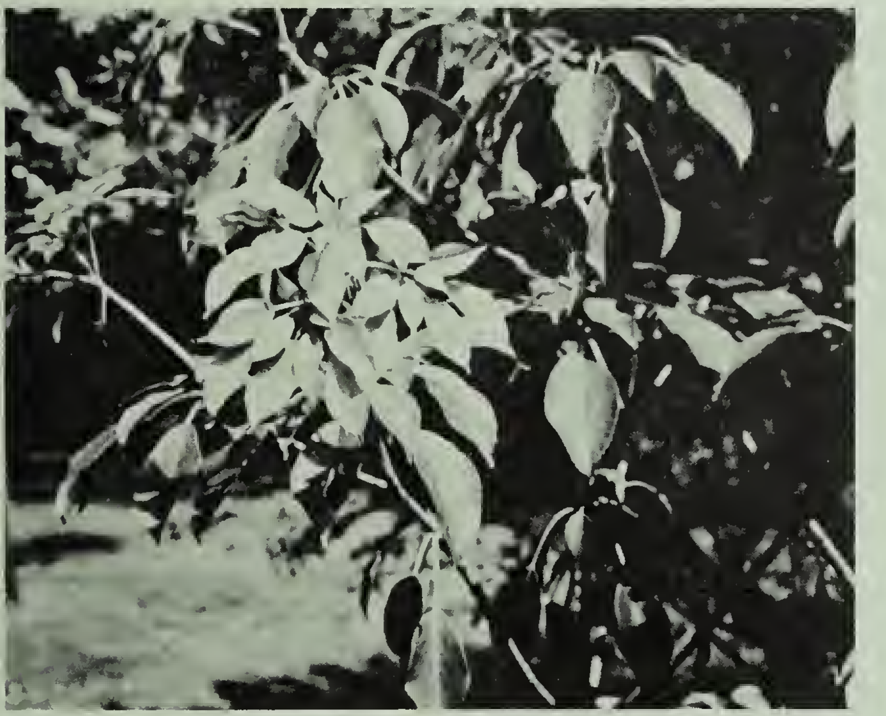

Fig. 1 Foliage of *Trochodendron aralioides*

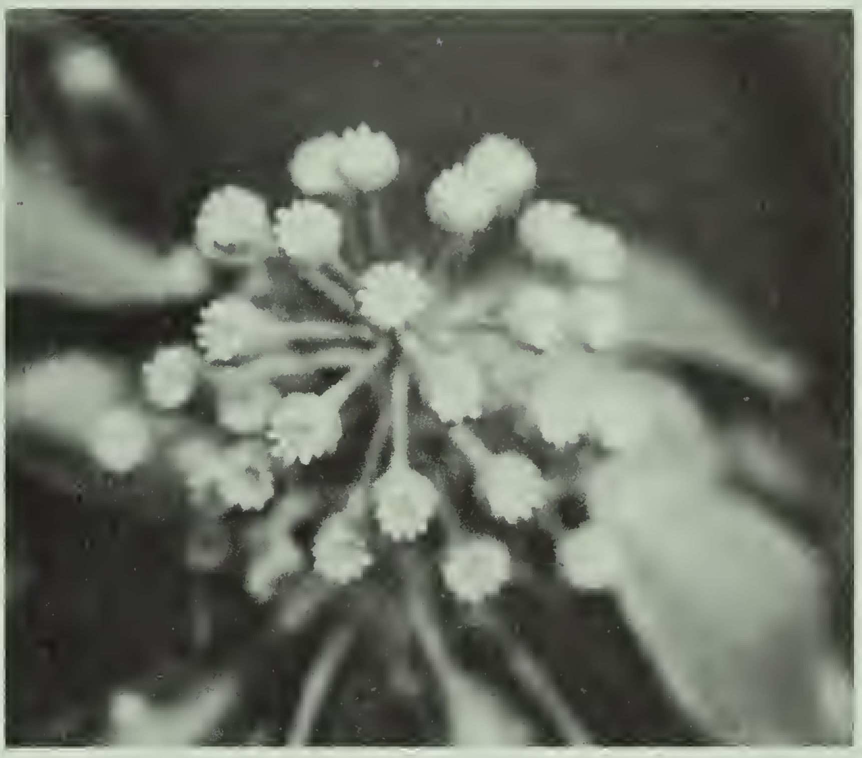

Fig. 2. Fruit of *Trochodendron aralioides*

The Arboretum's specimen of this plant was obtained in 1950 by Mrs. Barnes from the Kingsville Nurseries at Kingsville, Maryland. It is today a healthy symmetrical specimen about 6½ feet tall, although to the best of our knowledge it has never produced flowers.

When our Garden Tour was in Japan in the spring of 1969 we had the good fortune to see large specimens of this species both in flower and fruit. The accompanying photograph was very kindly taken for me by Mr. Albert M. Suggs, who was a member of our party. (Fig. 2)

Although listed in Rehder's "Manual of Cultivated Shrubs and Trees" (Ed. 2) as adapted to Zone VII, which lies well to the south of us, the species has proved hardy here in a fairly exposed situation. I have also seen it growing as far north as Princeton, New Jersey.

In view of the increasing interest in broad-leaved evergreens it would seem that this plant is worthy of consideration by gardeners in the Delaware Valley.

J. M. F., Jr.

NOTES FROM THE ARBORETUM

The Staff

Dr. Gordon's excellent map of the Natural Vegetation of Ohio was the subject of an article in a recent issue of the Ohio Journal of Science. As a member of the editorial Committee of the West Chester Bird Club, Dr. Gordon was responsible for the editing of a revised Check List of Chester County birds. On October 18 he presented an illustrated lecture dealing with the Principles of Ecology to the Merion Garden Club.

Dr. Penny is continuing his researches in palynology, studying the fossil pollen and spores at the type locality of the Magothy Formation in Maryland. He has been elected Secretary of the Board of Trustees of LaSalle College and Vice President of the Warrington Civic Association of Bucks County, Pa.

The June issue of the Morris Arboretum Bulletin contained an article on "The Big Trees of Southeastern Pennsylvania" by Dr. Swartley, who has also prepared a map of all existing trees and shrubs in Bartram's Garden. On August 12 Dr. Swartley received an "Award of Merit" from the International Shade Tree Conference and on October 26 he spoke to the Friends of the Wissahickon on the "Big Trees of Southeastern Pennsylvania." All hemlock enthusiasts will be pleased to learn that Dr. Swartley is preparing a book on this important genus of Conifers.

On October 1 Dr. Fogg addressed the Bala-Cynwyd Garden Club on the subject of "New and Unusual Shrubs." He repeated this same talk to the Haddonfield Garden Club on November 12. At the regular meeting of the Philadelphia Botanical Club on December 17 he spoke on "A Botanist in Scandinavia," and on February 18 he lectured to the Mill Creek Valley Garden Club on "The Pine Barrens of New Jersey."

Harvest Show Exhibit

Exhibit of Taxads and Conifers at the Harvest Show

On the occasion of the Annual Harvest Show, sponsored by the Pennsylvania Horticultural Society on October 3 and 4, 1970, the Arboretum mounted an exhibit of Taxads and Conifers. Again we are indebted to Mrs. Thomas H. Atherton and Mrs. E. Perot Walker for their kindness in arranging and labeling this material in a manner that was both educational and attractive.

Of the more than 60 specimens included in this exhibit eight belonged to the Taxaceae or Yew Family. There were four species of Yew (*Taxus*), three of plum-yew (*Cephalotaxus*) and the Japanese Torreya (*T. nucifera*).

The Pinaceae (The largest family of Conifers) was represented by 35 specimens of which 15 belonged to the genus *Pinus.* There were five firs (*Abies*), four spruces (*Picea*), and all three species of *Cedrus:* the Atlas cedar (*C. atlantica*) the cedar of Lebanon (*C. libani*) and the deodar (*C. deodara*). There were three hemlocks, three larches, a golden larch (*Pseudolarix amabilis*) and a Douglas fir (*Pseudotsuga Menziesii*).

Seven genera of the Taxodiaceae or Taxodium Family were shown, namely, *Cryptomeria, Cunninghamia, Sciadopitys, Taxodium, Sequoiadendron* and the California redwood (*Sequoia sempervirens*) of which the Arboretum is believed to have the only mature tree in the Philadelphia area.

All five genera of the Cupressaceae which are hardy in this area were shown. These included *Chamaecyparis* (seven species and varieties), *Juniperus, Calocedrus (Libocedrus), Thuja* and an Arizona cypress (*Cupressus arizonica*) of which the Arboretum has one of the few specimens in cultivation in this region.